ONcore 12-Port 25 Mbps ATM I/O Module Installation and User's Guide

Federal Communications Commission Notice

This equipment was tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case you must correct the interference at your own expense.

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This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

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This equipment was tested and conforms to the Council Directive 89/336/EEC for electromagnetic compatibility. Conformity with this directive is based upon compliance with the following harmonized standards:

EN 55022 – Limits and Methods of Measurement of Radio Interference

EN 50082-1 – Electromagnetic Compatibility Generic Immunity Standard: Residential, Commercial, and Light Industry

Warning: When used with unshielded cables, this is a Class A product. In a domestic environment, this product may cause radio interference, in which case you may be required to take adequate measures.

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How to Use This Guide

This guide presents information on how to install and configure the 3Com ONcore ATM I/O Module (6412M-25-TP) in the ONcore Integrated System Hub or CELLplex 4000 expansion unit. It describes how to:

Plan and set up valid links in an ONcore hub or CELLplex 4000 based ATM subnetwork using the 6412M-25-TP module

Install the 6412M-25-TP module

Configure the 6412M-25-TP module

Diagnose and solve problems associated with the operation of the 6412M-25-TP module.

Who Should Use This Guide

This guide is intended for the following people at your site:

ATM network administrator
ATM network operator
Hardware installer

The installation activities described in this book should be undertaken by **Trained Service Personnel ONLY**.

Contents of This Guide

This guide contains four chapters and three appendixes:

Chapter 1, Overview gives an overview of the main functions of the 6412M-25-TP module and the ATM interface used by ONcore 12-Port 25 Mbps ATM I/O Module ports to interconnect user devices to an ATM campus network.

Chapter 2, Installation describes how to install the 6412M-25-TP module in an ONcore hub and CELLplex 4000 expansion unit.

Chapter 3, Configuration describes how to configure the 6412M-25-TP module.

Chapter 4, Troubleshooting describes how to diagnose and solve problems associated with the operation of the 6412M-25-TP module.

Appendix A, Technical Specifications describes the specifications for the 6412M-25-TP module.

Appendix B, ATM Components lists the part numbers for the ATM components that you can order for use with the 6412M-25-TP module.

Appendix C, Technical Support provides information on technical support services available from 3Com.

The **Index** lists the concepts, terms, and tasks described in this guide and the page numbers on which you can find the information.

Terms Used in This Guide

The term *ATM Control Point* used in this guide refers to the ATM Control Point located in either the ONcore ATM Switch/Control module or CELLplex 4000 base unit.

The term *Command Reference Guide* used in this guide refers to the *ONcore ATM Switch and CELLplex 4000 Command Reference Guide*, 17-00866.

Prerequisite Knowledge

To understand the information presented in this guide, refer to:

Features and Characteristics of the ONcore Integrated System Hub, as described in the *3Com ONcore Integrated System Hub Installation Guide*, Document Number: 17-00362.

Features and Characteristics of the CELLplex 4000, as described in *CELLplex 4000 Installation and User's Guide*, Document Number: 17-00865.

Publications listed in the section "Related Documents" on page xv.

ATM Forum UNI Specification V3.0 and V3.1.

Conventions Used in This Guide

The following text conventions are used in this guide:

Text Convention	Meaning	Example
Bold	Text emphasis	**Selective backpressure** temporarily stops one virtual connection. **Global backpressure** temporarily stops an ATM link.
Italics	Special term	This is known as a *hot swap*.
	Document titles	Refer to the *ATM User-Network Interface Specification - Version 3.0* for more information.
`Monospace`	Command syntax (parameters and variables)	`SET PORT slot.port ENABLE`
	User input (including carriage return)	To display detailed information, enter the following command: `show port 4.2 verbose [ENTER]`
	System messages and screen displays	`Port   Type   Mode      Status` `-------------------------------------------` `4. 2   NNI    enabled   UP-OKAY`

Related Documents

This section provides information on supporting documentation, including:

3Com Documents

Reference Documents

3Com Documents

The following documents provide additional information on 3Com products:

ONcore Integrated System Hub Installation and Operation Guide - Provides information on the installation, operation, and configuration of the ONcore hub. This guide also describes the principal features of the ONcore Fault-Tolerant Controller Module.

CELLplex 4000 Installation and User's Guide - Provides information on the installation, operation, and configuration of the CELLplex 4000.

ONcore Distributed Management Module User's Guide - Provides information on the ONcore Distributed Management Module's operation, installation, and configuration. This guide also describes the software commands associated with the Distributed Management Module.

Distributed Management Module Commands Guide - Describes each management command by providing detailed information on the command's format, use, and description.

ONcore ATM Switch and CELLplex 4000 Command Reference Guide - Describes each ATM command by providing detailed information on the command's format, use, and description.

For a complete list of 3Com documents, contact your 3Com representative.

Reference Documents

The following documents supply related background information:

Case, J., Fedor, M., Scoffstall, M., and Davin, J., *The Simple Network Management Protocol,* RFC 1157, University of Tennessee at Knoxville, Performance Systems International and the MIT Laboratory for Computer Science, May 1990.

Rose, M., and K. McCloghrie, *Structure and Identification of Management Information for TCP/IP-based internets,* RFC 1155, Performance Systems International and Hughes LAN Systems, May 1990.

Chapter 1. Overview

This chapter presents an overview of the ONcore 12-Port 25 Mbps ATM I/O Module (6412M-25-TP). It describes the main functions of the module, and how the module operates as part of the ATM subsystem when installed in the ONcore Integrated System Hub or CELLplex 4000 Expansion Unit.

6412M-25-TP Module Features

The 6412M-25-TP module is a single-slot module that functions as part of the ONcore ATM or CELLplex 4000 Expansion Unit.

6412M-25-TP modules can be used in any of the following ways:

   To send and receive data from an ATM subsystem in another ONcore ATM
   switching hub or CELLplex 4000.

   To attach high capacity workstations and servers (with 25.6Mbps adapter cards)
   that function in ATM mode.

6412M-25-TP modules interface to the ONcore hub or CELLplex 4000 by means of the
Control Point located in either the ONcore ATM Switch/Control module or CELLplex
4000 base unit. 6412M-25-TP modules process ATM cells of data by:

   Checking their validity

   Accessing the switching tables to locate the destination module

   Preparing the internal ATM format required by the Control Point

   Sending the cells to the Control Point

6412M-25-TP modules can be used in any vacant slot in the CELLplex 4000 expansion
unit, or any vacant slot in the ONcore hub except for slots 9, 10, and (for 17-slot
models) 11 and 12. These slots are reserved for ONcore ATM Switch/Control modules.
In 17-slot ONcore models, although slot 12 is also reserved, you can insert an
6412M-25-TP module in slot 12 if no ONcore ATM Switch/Control module is installed in
slot 11.

Like other ATM media modules, the 6412M-25-TP module can be inserted while the
hub or CELLplex 4000 is operating without disturbing data traffic on other modules.
Before removing the module however, you must first isolate it by using the SET
MODULE command.

For more information on how to install and change modules, see the *ONcore Integrated
System Hub Installation Guide*, Document Number 17-000362 or *CELLplex 4000
Installation and User's Guide* Document Number 17-000865, as appropriate.

Module Functions

The 6412M-25-TP module has the following characteristics:

Twelve ports operating at up to 25 Mbps to connect stations or servers to the hub or CELLplex 4000. Each port may connect to:

- An ATM or multimedia workstation that requires a high bit rate (UNI connection)
- A UNI device using a supported interface

Physical interface: copper cable with RJ45 connector.

ONcore 12-Port 25 Mbps ATM I/O Module connections: port-to-port, hub-to-server, and hub-to-workstation.

Up to three 6412M-25-TP modules can be used in the CELLplex 4000 expansion unit, thereby providing up to 48 ATM ports.

Up to fourteen 6412M-25-TP modules can be used in the 17-slot ONcore hub at the same time (8 in the 10-slot ONcore hub).

Interfaces Supported

The 6412M-25-TP module supports the following interfaces:

User-to-network (UNI)
Network-to-network (NNI)
Switch-to-switch (SSI)

The UNI interface is defined in the following documents:

ATM Forum UNI Specification V3.0 and V3.1
ITU (ex-CCITT) SG13 as defined in the following standards:
- I.413 (B_ISDN User-Network Interface)
- I.432 (Physical Layer)
- Q.2931 (Signaling)

Using the 6412M-25-TP Module for ATM Campus Networking

The 6412M-25-TP module can be used as a link to an ATM campus network by allowing workstations, servers, and other ATM devices to communicate with the network.
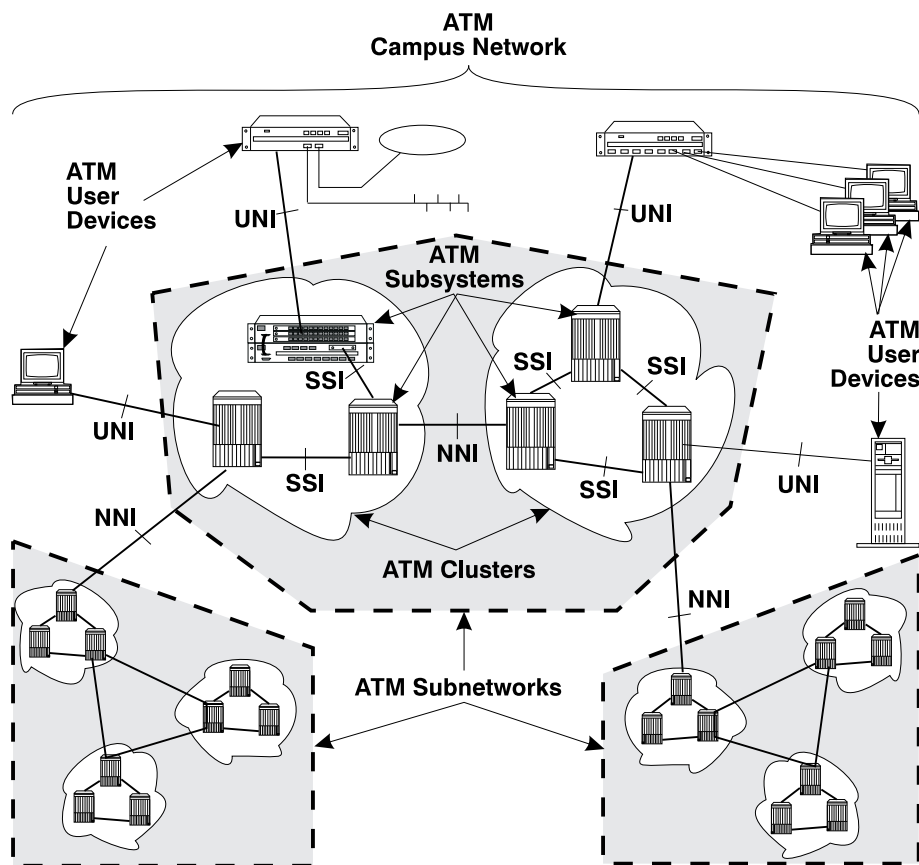
Figure   1-1. ATM Campus Networking

Chapter 2. Installation

This chapter describes how to unpack, install, and connect ATM devices to the 6412M-25-TP module.

Before You Unpack the Module

Take the following precautions before unpacking the 6412M-25-TP module:

Do not remove the 6412M-25-TP module from its anti-static shielding bag until you are ready to install it. This avoids the possibility of having electrostatic discharge damage static-sensitive devices on the module.

Always handle the module by the edges.

Always use a foot strap and grounded mat or wear a grounded static discharge wrist strap whenever you inspect or install or remove the module. Or else, be sure to touch a grounded rack or another source of ground **before** handling it.

Unpacking the Module

To unpack the 6412M-25-TP module, follow these steps:

1. Verify that the 6412M-25-TP module is the correct model by matching the model number listed on the side of the shipping carton to the model number you ordered.

   Note: The product model number printed on the shipping box differs from the model number on the product. The model number on the shipping box bears the prefix 3C9.

2. Remove the module from its shipping carton.

3. Remove the 6412M-25-TP module from its anti-static bags and inspect it for damage. Always handle it by the edges, being careful not to touch the internal components.

   If the module appears to be damaged, put it back in the anti-static bag, put the bag back into the shipping carton, then contact your local 3Com dealer.

It is recommended that you retain the shipping carton and the anti-static shielding bag in which the module was delivered. These can be reused later if you want to repackage the components for storage or shipment.

Installation Summary

Note: The installation activities described in the following sections should be undertaken by TRAINED SERVICE PERSONNEL ONLY.

Table 2-1 lists the steps to follow to install the 6412M-25-TP module. Each step is described in detail in this chapter.

Note: Before installing an 6412M-25-TP module in an ONcore switching hub, make sure that an ONcore ATM Switch/Control module is installed in slots 9 and 10 (or 11 and 12 in a 17 slot model), and that an ONcore ATM Switch/Control console has already been configured. If an ONcore ATM Switch/Control module is not installed, the Reset LED on the 6412M-25-TP module will start blinking when you insert the module.

Table   2-1. Installation Steps

Step	Refer to
1. Insert the 6412M-25-TP module into a vacant slot: **ONcore:** 1 to 8 on 10-slot models (or 1 to 8, 12 to 17 on 17-slot models). **CELLplex 4000:** Any vacant slot in the expansion unit.	"Installing the Module in an ONcore Hub" on page 2-4 (ONcore) "Installing the Module in a CELLplex 4000 Expansion Unit" on page 2-7 (CELLplex 4000)
2. Set up connections between the ONcore 12-Port 25 Mbps ATM I/O Module ports and other ATM devices using the appropriate Twisted Pair (TP) cables and connectors.	"Connecting ATM Devices" on page 2-10

Installation

You can install the 6412M-25-TP module while the ONcore hub or CELLplex 4000 expansion unit are powered on.

Installing the Module in an ONcore Hub

To install a 6412M-25-TP module in an ONcore hub, follow these steps:

1. Locate a vacant slot in positions 1 to 8 (or 12 to 17 in 17 slot models). (Slots 9 and 10 are reserved for the ONcore ATM Switch/Control module. You cannot install the 6412M-25-TP module in slot 11.) If necessary, remove a panel on the hub to expose a blank slot.

2. Make sure that the slot to be used is in Isolated mode by entering the following command from the ONcore ATM Switch/Control console:

   ```
   SET MODULE slot ISOLATED
   ```

   where `slot` specifies the number of the slot to be used. For more information, see the *ONcore Integrated System Hub Installation Guide*, Document Number 17-000362.

3. Insert the 6412M-25-TP module into one of the free slots in the hub as shown in Figure 2-1 on page 2-5, matching the top and bottom board guides as you slide the module cleanly into place (by pressing evenly on the top and bottom of the faceplate). Do not attempt to push the module all the way into the hub until you have verified that the top and bottom module ejectors are OPEN (see Figure 2-2 on page 2-6.)
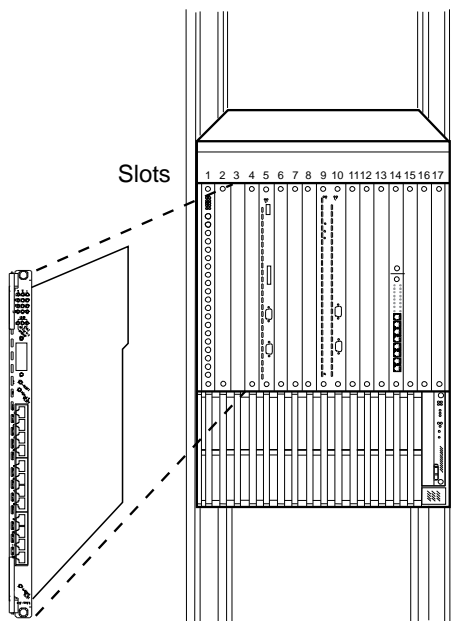
Figure   2-1. Installing the Module in an ONcore Hub

4. Close the top and bottom ejectors simultaneously.

Open
Position

Closed
Position

Half-height Level →

Apply Pressure Here →

Figure   2-2. ONcore Module Ejectors

5. The Reset LED should light ON briefly, and then turn OFF.

6. Fasten the spring-loaded screws on the front panel of the module to the hub using
   your fingers. Do not overtighten.

Installing the Module in a CELLplex 4000 Expansion Unit

To install a 6412M-25-TP module in a CELLplex 4000 expansion unit, follow these steps:

1. Locate a vacant slot in the expansion unit. If the slot is filled with a blank panel, loosen the knurled screws on both sides of the cover and remove it from the front panel of the expansion unit.
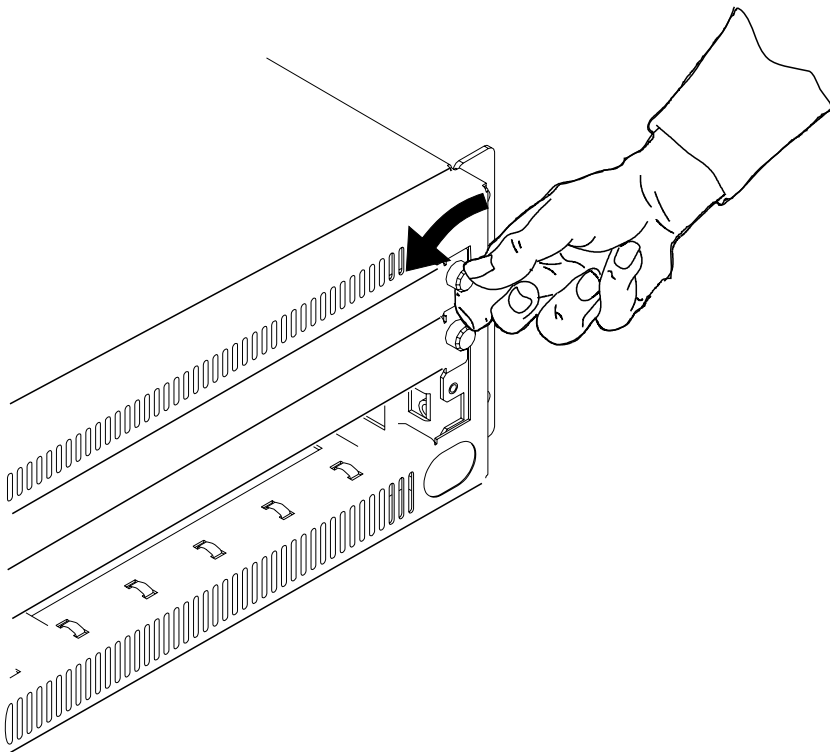
Figure   2-3. Removing a Blank Panel

Store the blank panel in a safe place in case the ATM media module needs to be removed in the future.

2. Make sure that the slot to be used is in Isolated mode by entering the following command from the ATM console:

```
SET MODULE slot ISOLATED
```

where `slot` specifies the number of the slot to be used. For more information, see the *CELLplex 4000 Installation and User's Guide*.

3. Make sure that the two module ejectors (left and right) are OPEN (see Figure 2-4.)
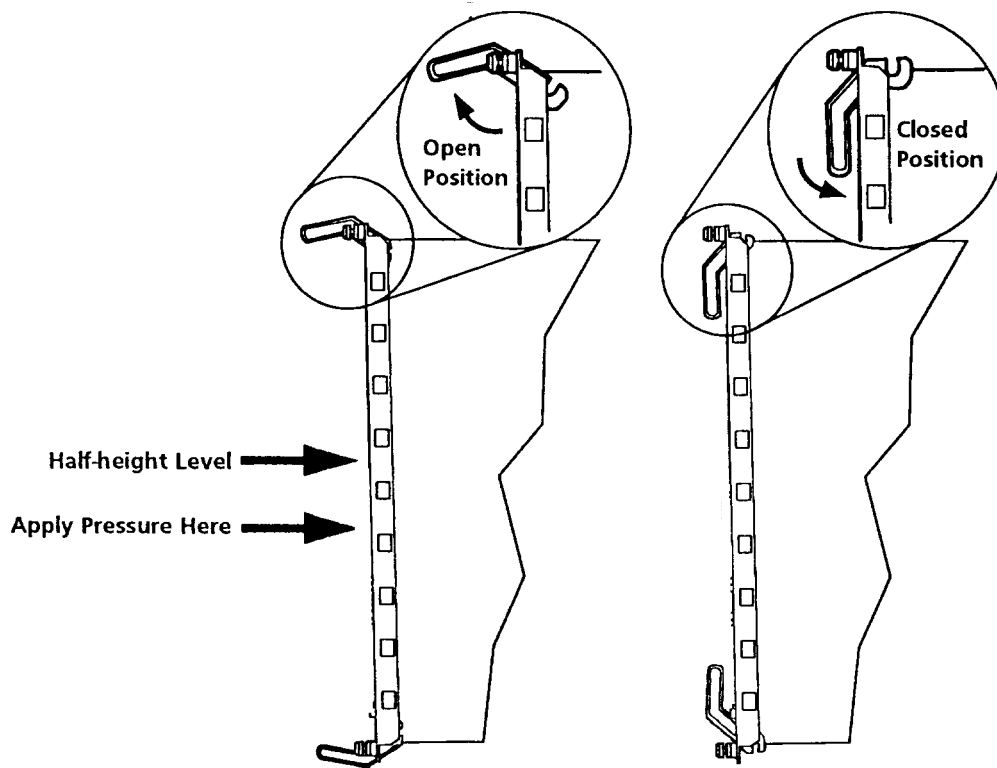
Figure   2-4. CELLplex 4000 Module Ejectors

4. Insert the 6412M-25-TP module into one of the free slots in the expansion unit as shown in Figure 2-5, matching the left and right board guides as you slide the module cleanly into place (by pressing evenly on the top and bottom of the faceplate).
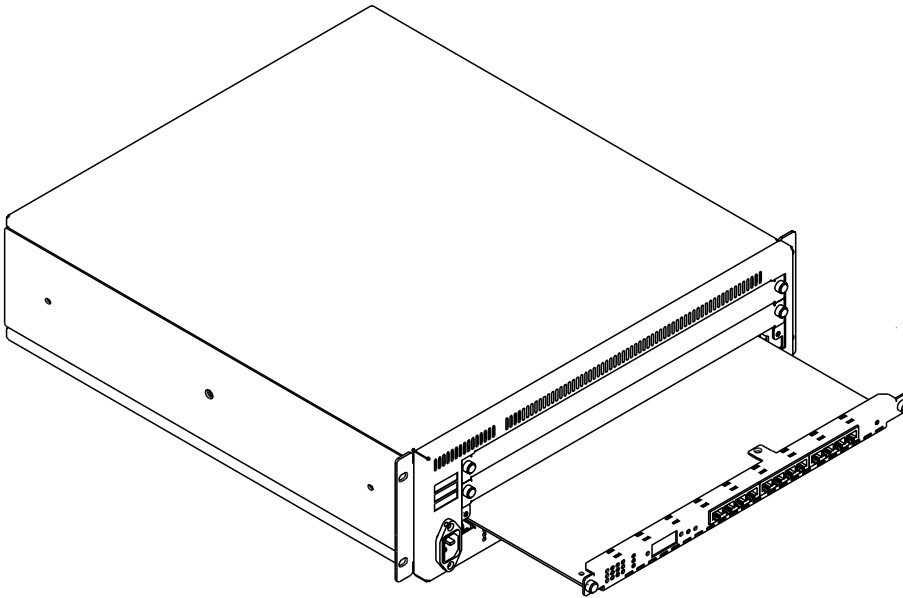
Figure 2-5. Installing the Module in a CELLplex 4000 Expansion Unit

5. Close the left and right ejectors simultaneously. This secures the module.

6. The Reset LED should light ON briefly, and then turn OFF.

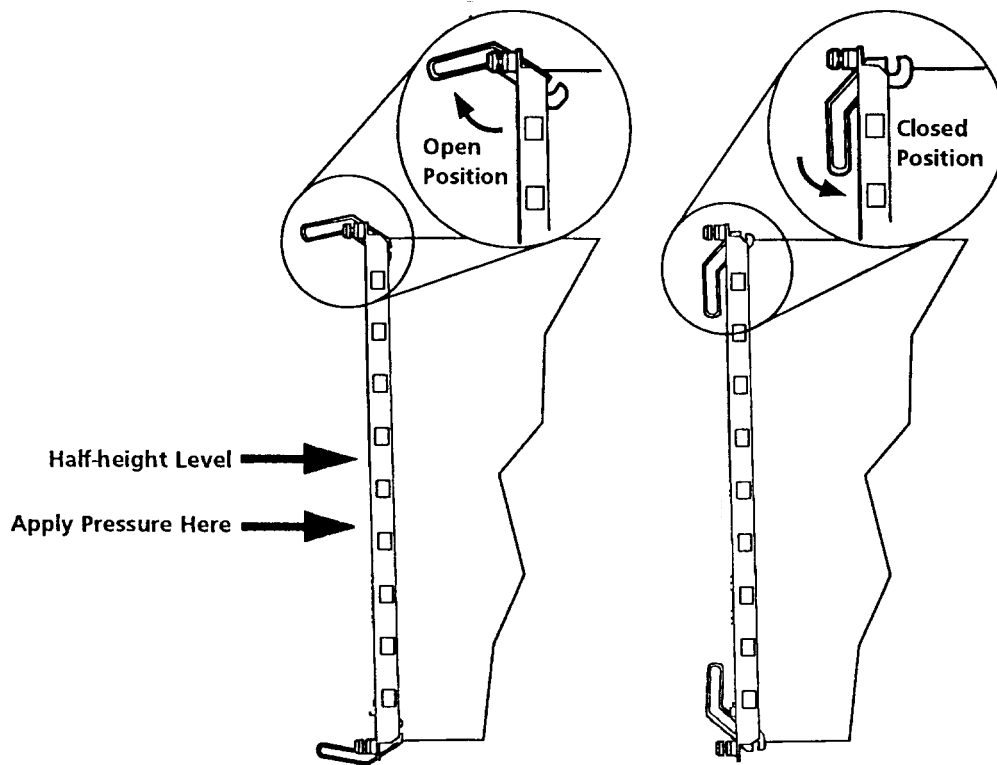7. Fasten the spring-loaded screws on the front panel of the module to the expansion unit using your fingers. Do not overtighten.

Connecting ATM Devices

After inserting the module, attach the cables to the ATM ports that will connect to ATM devices.

Cabling Up

The following sections provide instructions and guidelines for connecting ATM devices (such as switches, servers, personal computers, and workstations). Remember these tips when connecting cables:

Avoid stretching and bending the cables too much.

Avoid routing the cables near potential sources of electromagnetic interference, such as motorized devices and fluorescent lights.

Avoid trip hazards by routing the cables away from aisles and other areas where people walk. If such routes cannot be avoided, use floor cable covers or similar material to secure and protect the cables.

Be sure that the cables connected to the 6412M-25-TP module are supported so that the cable connectors are not excessively strained. The cable management bracket shipped with the ONcore hub or CELLplex 4000 expansion unit helps prevent strain on the cables.

Use a Category 3 or better UTP cable or a 150-ohm STP cable for each of the ATM ports.

UTP/FTP/STP Cabling Information

Table 2-2 details the accepted UTP/FTP/STP cables for the 25.6 Mbps ATM ports.

Table 2-2. UTP/FTP/STP Cabling Details

Cable Type	Impedance	Category	Trunk Attenuation @ 100 MHz	Patch Attenuation @ 100 MHz	RFI Class
UTP-5	100 ohm	5 / Class D	22db MAX / 100m	33db MAX / 100m	A
FTP/SFTP	100 ohm	5 / Class D	22db MAX / 100m	33db MAX / 100m	B
FTP/SFTP	120 ohm	5 / Class D	17db MAX / 100m	25db MAX / 100m	B
STP	150 ohm	IBM Cabling	IBM type 1/1A 12.3db MAX / 130m	IBM type 6/6A 18.4db MAX / 130m	B

Legend:

UTP-5 Unshielded Twisted Pair (Category 5)
FTP Foiled Twisted Pair
SFTP Screened and Foiled Twisted Pair
STP Shielded Twisted Pair
TRUNK rigid cable
PATCH flexible cable

Cabling Distances

Table 2-3 lists the maximum cabling distances for devices attached to the 25.6-Mbps ATM ports.

Table   2-3. ATM Device Cabling Distances

Cable Type	Maximum Allowable Distance (meters)
UTP Category 3	100 (330 ft)
UTP Category 4	150 (495 ft)
UTP Category 5	160 (528 ft)
STP	300 (990 ft)

Note: The minimum UTP cable quality must meet EIA/TIA-568 specification for Category 3 or equivalent UTP wiring.

Connecting Devices to the ATM Ports

You can connect devices to the ATM ports either through the building wiring or by a direct connection.

Via Building Wiring

To connect an ATM device via building wiring, follow the steps listed below.

Note: This procedure begins with the cabling of the ATM device (such as a 25.6-Mbps ATM adapter installed in a workstation) to the building faceplate; then it describes connecting the ONcore switching hub or CELLplex 4000 to the patch panel in the wiring closet.

___ **1** Look at the cabling chart, which your network planner provided, to determine how the ONcore switching hub or CELLplex 4000 should be connected to the network.

___ **2** In the work area, connect one end of a straight-through cable (with ATM-compliant pin assigments) to the ATM connector on the device and the other end to the ATM connector on the faceplate where the building wiring terminates.

___ **3** Label the faceplate if it does not already have a cable label. Follow your enterprise's procedures for cable labeling. If there is more than one wiring closet on a floor, record on the same line, the wiring closet identifier or location and the cable identifier.

___ **4** In the wiring closet, connect the cable that originated at the ATM device to the appropriate connector on the patch panel or other equipment where the building wiring terminates. Connect the other end of the cable to an ATM port on the 6412M-25-TP module.

___ **5** Label the connector on the patch panel (or other equipment used to terminate the building wiring).

Direct Cabling

To cable an ATM device directly to the 6412M-25-TP module:

__ **1** Look at the cabling chart, which your network planner provided, to determine how the ONcore hub or CELLplex 4000 should be connected to the network.

__ **2** Connect the cables between the 6412M-25-TP module and other devices as indicated by the connections in the cabling chart.

__ **3** Label the cables, following your enterprise's procedures for cable labeling.

Cables, Pins and Connectors

Each of the ATM ports on the 6412M-25-TP module connects to other ATM devices using an 8-pin female RJ-45 connector. The sections below describe the male RJ-45 plug and the twisted-pair cables that attach to this connector.

RJ-45 Connector

The RJ-45 connector is the 8-pin female connector on the CELLplex 4000 that attaches to UTP Category 3, 4, or 5 cable or STP category 1, 1A, 9, or 9A cable. Table 2-4 lists the signal name associated with each pin on this connector, and Figure 2-6 shows how the pins are numbered.

Table 2-4. RJ-45 Connector-Pin Signal Assignments

Pin Number	Signal Name
1	RD+
2	RD-
3-4-5-6	Frame Ground
7	TD+
8	TD-

UTP category 3, 4, or 5 cable
or
STP category 1/1A to 9/9A cable

RJ-45 modular plug connector

1
2
7
8
Pins
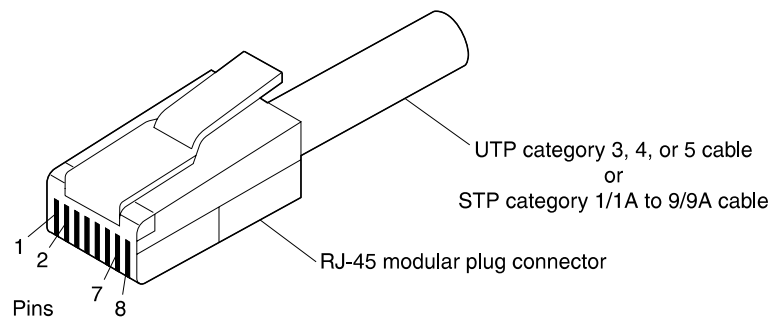
Figure 2-6. RJ-45 Connector

Twisted-Pair Cable

Figure 2-7 on page 2-16 below shows the pin-outs for the straight-through cable required for connecting ATM Forum compliant devices via UNI interface to the ports on the 6412M-25-TP module.

Note: Pins 3, 4, 5, and 6 are *not used* and are grounded on the chassis.
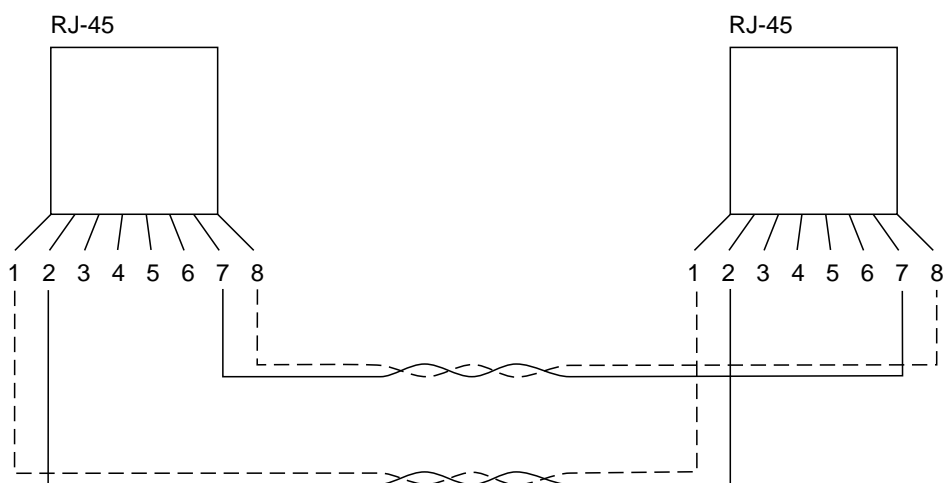
Figure 2-7. Straight-Through UTP Cable. Note that one cable connects pins 1 and 2 and the other cable connects pins 7 and 8. You will cause an error if you cable any other active pins together, such as 1 and 7, 1 and 8, 7 and 2, or 8 and 2.

Non-ATM Forum Compliant (UNI) Devices: To connect non-ATM Forum compliant devices to the 6412M-25-TP module you must build a twisted-pair cable that connects the pins as listed in Table 2-5 on page 2-17.

Table   2-5. Pin Assignments for Cabling Non-ATM Forum Compliant Devices

6412M-25-TP Module Port		Non-Compliant 25.6-Mbps Device	
1	RD+	3	TD+
2	RD-	6	TD-
7	TD+	4	RD+
8	TD-	5	RD-
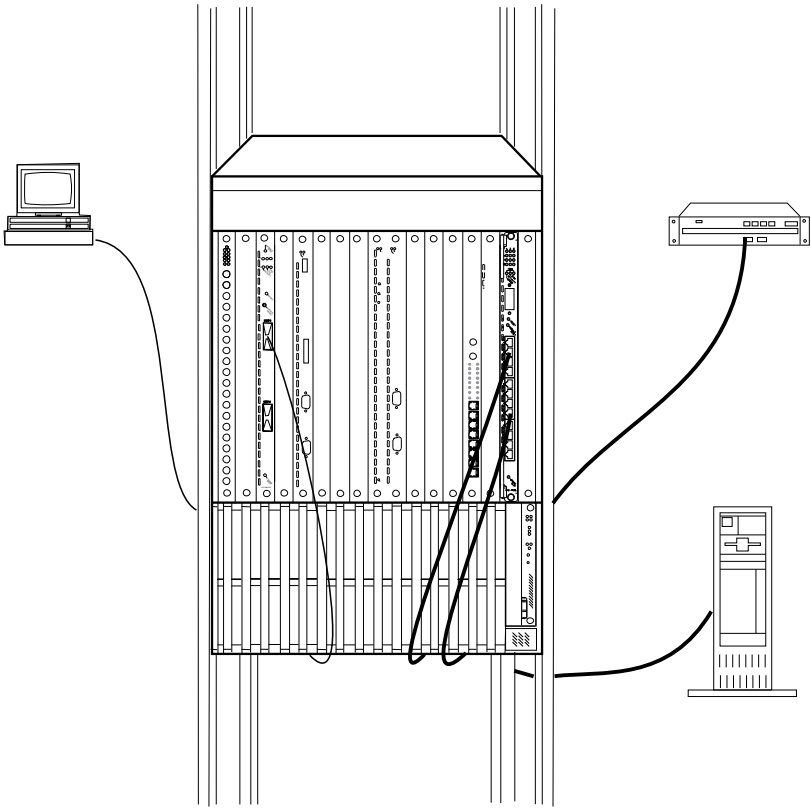
Figure   2-8. Attaching ATM Devices

Chapter 3. Configuration

After installing the 6412M-25-TP module and attaching media cables to ATM devices, you must enter configuration commands from the ATM console to:

Configure the ports parameters.

Connect the module to the network.

Enable the ports.

This section describes the ATM commands you need to enter to configure each 6412M-25-TP module in the ways described above. For a complete description of all ATM commands, see the *ONcore ATM Switch and CELLplex 4000 ATM Command Reference Guide* (hereafter referred to simply as the Command Reference Guide).

Configuring Port Parameters

The 6412M-25-TP module uses the user-to-network (UNI) interface. A UNI interface defines the interface between an ATM user device (such as a router, bridge, server, workstation, or concentrator equipped with an ATM adapter) and the ATM network.

Before you connect a 6412M-25-TP module to the ATM network (as described in "Connecting the Module to the Network" on page 3-6) and enable its ports, you must first set the type of ATM interface used on each port (UNI).

In addition, you can switch ILMI flow control on or off, and specify the ILMI characteristics.

When a port is enabled, it can transmit and receive cells in the ATM network. The port's parameters should be configured **before** the port is enabled.

To set individual port parameters, enter the following command at the ATM console prompt. The parameters may be entered in any order.

```
SET PORT slot.port mode type flow_control ilmi
```

slot   Slot number of the 6412M-25-TP module.

port   ATM port number.

mode   `enable` or `disable`. Enter `disable` until the port has been configured.

type   Type of interface used: `UNI` (user-to-network), `NNI` (network-to-network), or `SSI` (switch-to-switch). Default: Last value entered.

flow_control Used to activate or deactivate the ILMI flow control for this port:

    `FLOW_CONTROL:ON`   activates ILMI flow control (GFC field of the cell header)

    `FLOW_CONTROL:OFF`   deactivates ILMI flow control.

    Default: Last value entered.

ilmi   Specifies the ILMI characteristics for this port:

    `ILMI:NORMAL`   ILMI active with automatic detection of the signalling protocol version (UNI 3.0 or UNI 3.1). ILMI address registration is normally performed.

    `ILMI:FORCED_SIG_3.`   UNI 3.0 signalling is forced, and ILMI address registration active.

    `ILMI:FORCED_SIG_3.1` UNI 3.1 signalling is forced, and ILMI address registration active.

    `ILMI:OFF_SIG_3.`   UNI 3.0 signalling is forced, and ILMI address registration inactive.

    `ILMI:OFF_SIG_3.1`   UNI 3.1 signalling is forced, and ILMI address registration inactive.

    Default: Last value entered.

Example

The following example configures port 2 of the 6412M-25-TP module installed in slot 1.

```
ONcoreATM> set port 1.2 uni        [ENTER]

ONcoreATM> Port set.
ONcoreATM> show port 1.2 verbose        [ENTER]

     Type  Mode      Status
------------------------------------------------------------------------------
 1. 2:UNI   enabled   UP-OKAY

Signalling Version   : with ILMI
Flow Control         : Off
Connector            : RJ-45
Media                : copper twisted pair
Remote device is active
IX status            : IX OK
Port speed           : 256   Kbps

ONcoreATM>
```

Displaying Configuration Settings

The following sections describes how to display information about the module and its port configurations. By displaying this information, you can check that the module is properly configured before connecting it to the network.

Module Information

To display status information about a 6412M-25-TP module, use the SHOW MODULE command.

For example, to display configuration information about the 6412M-25-TP module in slot 2, you would enter the following command:

```
  ONcoreATM> show module 2 verbose

Slot Install Connect Operation General Information
----------------------------------------------------------------------
  2     Y       Y       Y      ONcore 12-Port 25 Mbps ATM I/O Module

status: connected / hardware okay
       enable  / normal
P/N:xxxxxxx EC level:xxxxxx Manufacturer:xxxx
Operational FPGA version : 1
     Backup FPGA version : 1

     Type   Mode     Status
----------------------------------------------------------------------
 2. 1:UNI   enabled  UP-OKAY
 2. 2:UNI   enabled  UP-NO ACTIVITY
 2. 3:UNI   enabled  UP-NO ACTIVITY
 2. 4:UNI   enabled  UP-OKAY
 2. 5:UNI   enabled  UP-OKAY
 2. 6:UNI   enabled  UP-OKAY
 2. 7:UNI   enabled  UP-NO ACTIVITY
 2. 8:UNI   enabled  UP-NO ACTIVITY
 2. 9:UNI   enabled  UP-NO ACTIVITY
 2.1 :UNI   enabled  UP-NO ACTIVITY
 2.11:UNI   enabled  UP-NO ACTIVITY
 2.12:UNI   enabled  UP-NO ACTIVITY
 2.13:NOT INSTALLED

ONcoreATM>
```

If the value for `port status` indicates that the port is inoperational or not functioning properly (for example, `NOT IN SERVICE` or `NO ACTIVITY`), refer to the chapter called "Troubleshooting", in the *ONcore ATM Switch/Control Module Installation and User's Guide*, Document Number 17-00616.

For more information on the SHOW MODULE command, see the Command Reference Guide.

Port Information

To display status information about the ports of an 6412M-25-TP module, use the
SHOW PORT command.

The following example shows how to display detailed information about port 1 of the
6412M-25-TP module in slot 1:

```
ONcoreATM> show port 1.1 verbose

Port display for ONcore 12-Port 25 Mbps ATM I/O Module

Type  Mode    Status
--------------------------------------------------------------------------
 1. 1:UNI enabled  UP-NO ACTIVITY

Signalling Version  : with ILMI
Flow Control        : Off
Connector           : RJ45
Media               : copper twisted pair
Remote device is active
IX status           : IX OK
Port speed          : 256   Kbps

ONcoreATM>
```

For more information on the SHOW PORT command, see the Command Reference
Guide.

Saving Configuration Settings

After configuring the 6412M-25-TP module and port settings, save the settings by
entering the SAVE MODULE_PORT command.

Connecting the Module to the Network

When you install an 6412M-25-TP module, it is by default set to Isolated mode and all of its ports are disabled. When a module is isolated, no network activity takes place on it and it cannot be accessed by the network. This is a security measure that protects your ATM network from unauthorized access and module dysfunction.

To establish the module's connection to the network, enter the following command at the ATM console prompt:

```
SET MODULE slot CONNECTED
```

where `slot` specifies the slot number of the ONcore 12-Port 25 Mbps ATM I/O module.

The module's ports will not be enabled. This allows you to configure individual ports before enabling them. If you wish to enable **all** ports using the current values (either the default values if the module has not been used, or the previous values entered), enter the following command:

```
SET MODULE slot CONNECTED ENABLE
```

If you wish to enable **individual** ports using the current values (either the default values if the module has not been used, or the previous values entered), enter the following command:

```
SET PORT slot.port ENABLE
```

Verifying Module Operation

After configuring and saving 6412M-25-TP module and port settings, you can verify that the module is operating correctly by viewing the LEDs on the front panel:

The Port Status light should be lit (Green if no traffic, Yellow when traffic is present)

The Module Reset LED should be off.

The Wrong Slot LED should be off.

Table 3-1 on page 3-8 provides a full description of the front panel LEDs.

Note: The 155M LEDs are reserved for future use.

Front Panel

ATM connections are made through the 6412M-25-TP module by means of the ports on its front panel and its backplane interfaces. The front panel is shown in Figure 3-1 on page 3-10. The meaning of each LED is shown in Table 3-1.

By pressing the Module Reset button, you interrupt and reset the operation of the 6412M-25-TP module. All ATM data traffic and connections that are being transmitted are stopped, and the Reset LED lights while the reset is performed. The change in status of the 6412M-25-TP module (from normal operation to reset status) is reported to the ATM Control Point.

Table 3-1 (Page 1 of 2). Meaning of the Front Panel LEDs

LED Name	Color	State	Meaning
Port Status	None	OFF	Port is disabled or there is no traffic.
	Green	ON	Port is enabled and there is a connection.
		Blinking	Port is enabled, but either no cable is connected or the cable is damaged, or there is no station at the other end of the connection.
	Yellow	ON (or blinking)	Normal operation (traffic detected).
Module Reset	Yellow	OFF	Normal operation. Module is not being reset.
		ON	Module is being reset; data traffic is interrupted.
		Blinking	No 6416SW installed or module faulty.

Table 3-1 (Page 2 of 2). Meaning of the Front Panel LEDs

LED Name	Color	State	Meaning
Wrong Slot	Yellow	OFF	Normal operation.
		ON (ONcore only)	Module is installed in an incorrect slot and no power is reaching the module. Check that the module is installed in the correct slot slot (1 to 8 on 10-slot models, 1 to 8 and 12 to 17 on 17-slot models).

See Chapter 4, "Troubleshooting" on page 4-1 if:

A Port Status LED does not light or is blinking.
The Reset LED is ON or is blinking.
The Wrong Slot LED is ON.

Port Status LEDs ——————

Module Reset LED ——————
Module Reset Button ——————

ATM Ports ——————

Wrong Slot LED ——————

Figure   3-1. Front Panel

Chapter 4.
Troubleshooting

This chapter describes how to diagnose and solve problems that may arise with the operation of an 6412M-25-TP module. These problems are signaled by the following conditions:

The Port Status LED of a port does not light green, or is blinking, when idle (connected and enabled but no traffic).

The Port Status LED of a port does not light yellow during data transmission.

The Reset LED is either ON or blinking.

The Wrong Slot LED is ON.

Before you start troubleshooting, be sure to carry out the procedure described in "Verifying LED Operation."

When instructed to replace an 6412M-25-TP module, proceed as described in "Replacing 6412M-25-TP Modules" on page 4-10.

Verifying LED Operation

Before troubleshooting an 6412M-25-TP module, verify that all LEDs on the module are functioning properly:

ONcore   Press the LED Test button on the Fault-Tolerant Controller module in the ONcore hub.

CELLplex 4000 Press the RESET button on the base unit. Note that this action will interrupt all traffic and reset the CELLplex 4000.

All LEDs on the module should light ON. If not, replace the module (see page 4-10).

Note: The 155M LEDs will not light. These LEDs are reserved for future use.

Port Status LED Does Not Light Green or Is Blinking When Idle

During normal operation, the Port Status LED of an 6412M-25-TP module should light GREEN if the port is enabled and a connection present. (The LED will light YELLOW during traffic.)

If the Port Status LED does not light GREEN or is blinking when there is no traffic, refer to Table 4-1 on page 4-3 to diagnose and solve the problem.

Table 4-1 (Page 1 of 2). Problem Determination Using Port Status LEDs

Status LED	Port Status	Possible Cause	Corrective Action
OFF	Disabled	Port is disabled.	Enable port.
	Enabled	6412M-25-TP module is not powered ON.	1) Check that the ONcore or CELLplex 4000 is connected to a power supply. 2) Check the power supply LED by following the instructions in "Verifying LED Operation" on page 4-1. 3) Re-insert the 6412M-25-TP module in the hub.
		Status LED is burned out.	1) Check the Status LED by following the instructions in "Verifying LED Operation" on page 4-1. 2) If the Port Status does not light, replace the module.
		6412M-25-TP module is faulty.	Perform the wrap tests described in "Determining the Failing Component Using a Wrap Test" on page 4-9.

Table 4-1 (Page 2 of 2). Problem Determination Using Port Status LEDs

Status LED	Port Status	Possible Cause	Corrective Action
Blinking	Enabled	No connector is attached to the port, or there is no device at the end of the connection.	Attach a connector to the port, or ensure that there is a device at the end of the connection.
		Cable attached to the port is faulty.	1) Change the cable. 2) Perform wrap tests to determine the failing component. 3) Check the cable type.
		Remote station attached to the port is either turned OFF or inoperational.	Check the remote station. If the station is turned OFF, turn ON the station. If the station is inoperational, restart the application that is running on it.
		Maximum link distance exceeded.	See Table 2-3 on page 2-12 for the maximum distances for valid connections.

Port Status LED Does Not Light Yellow During Traffic

If during continous traffic the Status LED of a port does not light YELLOW, refer to Table 4-2 on page 4-6 to diagnose and solve the problem.

Table   4-2. Problem Determination Using Port Status LEDs during Traffic

Status LED	Possible Cause	Corrective Action
OFF	Port is disabled.	Enter the SHOW PORT command at the ATM console to see if port is enabled.
	6412M-25-TP module is not powered ON.	1) Check the Port Status LED and the power supply LEDs by following the instructions in "Verifying LED Operation" on page 4-1. 2) Re-insert the 6412M-25-TP module in the hub.
	Status LED is burned out.	1) Check the Status LED by following the instructions in "Verifying LED Operation" on page 4-1. 2) If necessary, replace the module.
	6412M-25-TP module port is faulty.	Perform the wrap tests described in "Determining the Failing Component Using a Wrap Test" on page 4-9.
	There is a bad connection on the ATM backplane.	1) Remove the 6412M-25-TP module and re-insert it in the same slot. 2) If the problem persists, insert the module in another slot.
	UNI port is enabled but not in service.	From the ATM host, make sure that the station attached to the port has been assigned an ATM address and that the address is unique within the network.

When the Reset LED Is ON or Starts Blinking

When the Reset LED of an 6412M-25-TP module is ON or starts blinking, the module has entered into an error condition. Table 4-3 describes the possible problems that may occur and the corrective action to take for each problem.

Table   4-3. Problem Determination Using the Module Reset LED

Reset LED	Meaning	Possible Cause	Corrective Action
ON	6412M-25-TP module error condition	Module is faulty.	Perform the wrap tests described in "Determining the Failing Component Using a Wrap Test" on page 4-9.
		There is a bad connection on the ATM backplane.	1) Remove the module and re-insert it in the same slot. 2) If the problem persists, insert the module in another slot.
Blinking	6412M-25-TP module error condition	(ONcore only) ONcore ATM Switch/Control module is not installed.	Install an ONcore ATM Switch/Control module in slots 9 to 10 (or 11 to 12 in 17-slot model).
		Module is either faulty or not securely plugged into the ATM backplane.	1) Remove the module and re-insert it. 2) If the problem persists, replace the module.
		There is a bad connection on the ATM backplane.	1) Remove the module and re-insert it in the same slot. 2) If the problem persists, insert the module in another slot.

When the Wrong Slot LED Is ON (ONcore only)

When the Wrong Slot LED of an 6412M-25-TP module is ON, the module is not installed in the correct slot. Remove the module from the hub and re-insert it into any vacant slot in positions 1 to 8 (or 12 to 17 in 6017C-AC model). (Slots 9 to 10, and 11 in a 17-slot model are reserved for the ONcore ATM Switch/Control module.) Slot 12 in 17-slot models cannot be used if an ONcore ATM Switch/Control module is installed in slot 11.

Determining the Failing Component Using a Wrap Test

In the troubleshooting procedures in this chapter, you are sometimes instructed to perform a wrap test in order to determine the failing component that caused the problem.

To run a wrap test:

1. Enter the `SET PORT slot.port DISABLE` command, where `slot` is the slot number of the 6412M-25-TP module and `port` is the number of the port (1 through 12). Then press Enter.

2. Insert a wrap plug in the port.

3. Enter `WRAP slot.port EXTERNAL` where `slot` is the slot number of the module and `port` is the number of the port. Then press Enter.

   If you receive a return code of `KO Test Failed`, the port is faulty and the module motherboard should be replaced. Contact your 3Com Service Representative.

   If you receive a return code of `OK Test Successful`, test the line connected to the port.

Replacing 6412M-25-TP Modules

The troubleshooting procedures in this chapter sometimes instruct you to replace a failing 6412M-25-TP module. To do so, follow these steps:

1. Enter `SET MODULE slot ISOLATED` where `slot` is the slot number of the failed module. Then press Enter.

2. Remove the failed module and insert another 6412M-25-TP module in its slot.

3. Enter `SET MODULE slot CONNECTED` where `slot` is the slot number of the new module. Then press Enter.

The new module is automatically configured with the last settings configured for the slot number you entered.

Appendix A. Technical Specifications

General Specifications

Face Plate Marking   6412M-25-TP

Number of Ports   12

Connectors   RJ-45 copper

Electrical Specifications

Power Requirement   25 Watts

    1.2 Watts for +12V

Power Consumption   6 Amps for +5V
    0.10 Amps for +12V

Fuses   7 Amps for +5V
    1 Amp for +12V

Environmental Specifications

Operating Temperature 0°C to 50°C (32°F to 122°F)

Storage Temperature −10°C to +60°C (14°F to 140°F)

Humidity   0 to 95 % RH

Mechanical Specifications

Dimensions   2.5 cm. (1.0 in) Width
                      27 cm. (10.7 in) Length
                      38.5 cm. (15.25 in) Height

Weight   3.3 lbs (1.5 kg)

Appendix B. ATM Components

Table B-1 lists the part numbers of ATM components that can be ordered for use with the 6412M-25-TP module.

Table B-1. Part Numbers of ATM Components

ATM Component	3Com Part Number
RJ-45 wrap plug	42H0540

Appendix C. Technical Support

3Com provides easy access to technical support information through a variety of services. This appendix contains the following sections:

Online Technical Services

Support From Your Network Supplier

Support From 3Com Corporation

Returning Products for Repair

Accessing the 3Com ISD MIB

Contacting 3Com ISD Technical Publications

Online Technical Services

3Com offers worldwide product support 7 days a week, 24 hours a day, through the following online systems:

3Com Bulletin Board Service (3ComBBS)

World Wide Web site

3ComForum on CompuServe

3ComFacts^{SM} automated fax service

3Com Bulletin Board Service

3ComBBS contains patches, software, and drivers for all 3Com products, as well as technical articles. This service is available through a modem or ISDN 7 days a week, 24 hours a day.

Access by Analog Modem

To reach the service by modem, set your modem to 8 data bits, no parity, and 1 stop bit. Call the telephone number nearest you:

Country	Data Rate	Telephone Number
Australia	up to 14400 bps	Sydney (61) (2) 9937 5000 Melbourne (61) (3) 9653 9515
France	up to 14400 bps	(33) (1) 69 86 69 54
Germany	up to 9600 bps	(49) (89) 627 32 188 or (49) (89) 627 32 189
Hong Kong	up to 14400 bps	(852) 2501 1111
Italy (fee required)	up to 14400 bps	(39) (2) 273 00680
Japan	up to 14400 bps	(81) (3) 3345 7266
Singapore	up to 14400 bps	(65) 534 5693
Taiwan	up to 14400 bps	(886) (2) 377 5840
U.K.	up to 28800 bps	(44) (1442) 278278
U.S.	up to 28800 bps	(1) (408) 980 8204

Access by Digital Modem

ISDN users can call in to 3ComBBS using a digital modem for fast access up to 56 Kbps. To access 3ComBBS using ISDN, call the following number:

(408) 654-2703

World Wide Web Site

Access the latest networking information on the 3Com World Wide Web site by entering our URL into your Internet browser:

http://www.3Com.com/

This service features news and information about 3Com products, customer service and support, 3Com Corporation's latest news releases, selected articles from 3TECH (3Com Corporation's award-winning technical journal), and more.

3ComForum on CompuServe

3ComForum is a CompuServe-based service containing patches, software, drivers, and technical articles about all 3Com products, as well as a messaging section for peer support. To use 3ComForum, you need a CompuServe account.

To use 3ComForum:

1. Log in to CompuServe.
2. Enter `go threecom`.
3. Press Return to view the 3ComForum main menu.

3ComFacts Automated Fax Service

3Com Corporation's interactive fax service, 3ComFacts, provides data sheets, technical articles, diagrams, and troubleshooting instructions on 3Com products 7 days a week, 24 hours a day.

Call 3ComFacts using your touch-tone telephone. International access numbers are:

Country	Telephone Number
Hong Kong	(852) 2537 5610
U.K.	(44) (1442) 278279
U.S.	(1) (408) 727 7021

Local access numbers are available within the following countries:

Country	Telephone Number
Australia	800 123853
Belgium	0800 71279
Denmark	800 17319
Finland	98 001 4444
France	05 90 81 58
Germany	0130 8180 63
Italy	1678 99085
Netherlands	06 0228049
Norway	800 11062
Portugal	0505 442607
Russia (Moscow only)	956 0815
Spain	900 964445
Sweden	020 792954
U.K.	0800 626403

Support From Your Network Supplier

If additional assistance is required, contact your network supplier. Many suppliers are authorized 3Com service partners who are qualified to provide a variety of services, including network planning, installation, hardware maintenance, application training, and support services.

When you contact your network supplier for assistance, have the following information ready:

Diagnostic error messages

A list of system hardware and software, including revision levels

Details about recent configuration changes, if applicable.

If you are unable to contact your network supplier, refer to the following section on contacting 3Com.

Support From 3Com Corporation

If you are unable to receive support from your network supplier, technical support contracts are available from 3Com.

In the U.S. and Canada, call **(800) 876-3266** for customer service.

If you are outside the U.S. and Canada, contact your local 3Com sales office to find your authorized service provider:

Country	Telephone Number
Australia	(61) (2) 9937 5000 (Sydney)
	(61) (3) 9653 9515 (Melbourne)
Belgium*	0800 71429
Brazil	(55) (11) 546 0869

Country	Telephone Number
Canada	(416) 498 3266
Denmark*	800 17309
Finland*	0800 113153
France*	05 917959
Germany*	0130 821502
Hong Kong	(852) 2501 1111
Ireland*	1 800 553117
Italy*	1678 79489
Japan	(81) (3) 3345 7251
Mexico	(525) 531 0591
Netherlands*	06 0227788
Norway*	800 13376
Singapore	(65) 538 9368
South Africa	(27) (11) 803 7404
Spain*	900 983125
Sweden*	120 795482
Taiwan	(886) (2) 577 4352
United Arab Emirates	(971) (4) 349049
U.K.*	0800 966197
U.S.	(1) (408) 492 1790

* These numbers are toll-free.

Returning Products for Repair

A product sent directly to 3Com for repair must first be assigned a Return Materials Authorization (RMA) number. A product sent to 3Com without an RMA number will be returned to the sender unopened, at the sender's expense.

To obtain an RMA number, call or fax:

Country	Telephone Number	Fax Number
U.S. and Canada	(800) 876 3266, option 2	(408) 764 7120
Europe	31 30 60 29900, option 5	(44) (1442) 275822
Outside Europe, U.S., and Canada	(1) (408) 492 1790	(1) (408) 764 7290

Accessing the 3Com ISD MIB

The 3Com Management Information Base (MIB) for the Integrated Systems Division (ISD) describes commands that enable you to manage 3Com SNMP-based products. The MIB is available over the Internet on an anonymous FTP server. Updates to these MIBs are released as new 3Com products are introduced.

To access Internet versions:

1. FTP to `ftp.3com.com` (192.156.136.12).

2. Enter the login name `anonymous`.

3. Enter your full Internet e-mail address as the password (for example, `jdoe@company.com`).

4. Change to the mib or schema directory using the `cd /pub/mibs` or `cd /pub/mibs/all-mibs` command.

5. To view the 3Com MIB, OID, or schema entries, enter the `ls` command.

   To pause the display, press [Ctrl+S].
   To continue the display, press [Ctrl+Q].

6. Copy the MIB, OID, or schema files to your current directory using the appropriate command (for example, `get atswitch.mib`).

7. To exit the FTP session, invoke the `quit` command.

Contacting 3Com ISD Technical Publications

If you have comments or questions on 3Com Integrated Systems Division Technical Publications documents, contact the Technical Publications group by fax at (508) 229-1551.

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Limited Warranty

HARDWARE: 3Com warrants its hardware products to be free from defects in workmanship and materials, under normal use and service, for the following lengths of time from the date of purchase from 3Com or its Authorized Reseller:

Internetworking products	**1 year**
Network adapters	**Lifetime**
Ethernet stackable hubs and Unmanaged Ethernet fixed port repeaters	**Lifetime* (1 year if not registered).**
***Power supply and fans in these stackable hubs and unmanaged repeaters**	**1 year**
Other hardware products	**1 year**
Spare parts and spares kits	**90 days**

If a product does not operate as warranted above during the applicable warranty period, 3Com shall, at its option and expense, repair the defective product or part, deliver to Customer an equivalent product or part to replace the defective item, or refund to Customer the purchase price paid for the defective product. All products that are replaced will become the property of 3Com. Replacement products may be new or reconditioned. Any replaced or repaired product or part has a ninety (90) day warranty or the remainder of the initial warranty period, whichever is longer.

3Com shall not be responsible for any software, firmware, information, or memory data of Customer contained in, stored on, or integrated with any products returned to 3Com for repair, whether under warranty or not.

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STANDARD WARRANTY SERVICE: Standard warranty service for hardware products may be obtained by delivering the defective product, accompanied by a copy of the dated proof of purchase, to 3Com's Corporate Service Center or to an Authorized 3Com Service Center during the applicable warranty period. Standard warranty service for software products may be obtained by telephoning 3Com's Corporate Service Center or an Authorized 3Com Service Center, within the warranty period. Products returned to 3Com's Corporate Service Center must be pre-authorized by 3Com with a Return Material Authorization (RMA) number marked on the outside of the package, and sent prepaid, insured, and packaged appropriately for safe shipment. The repaired or replaced item will be shipped to Customer, at 3Com's expense, not later than thirty (30) days after receipt of the defective product by 3Com.

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(408) 764-5000

3/18/96

Limited Warranty X-6